

High Response Control Valve, Phase I

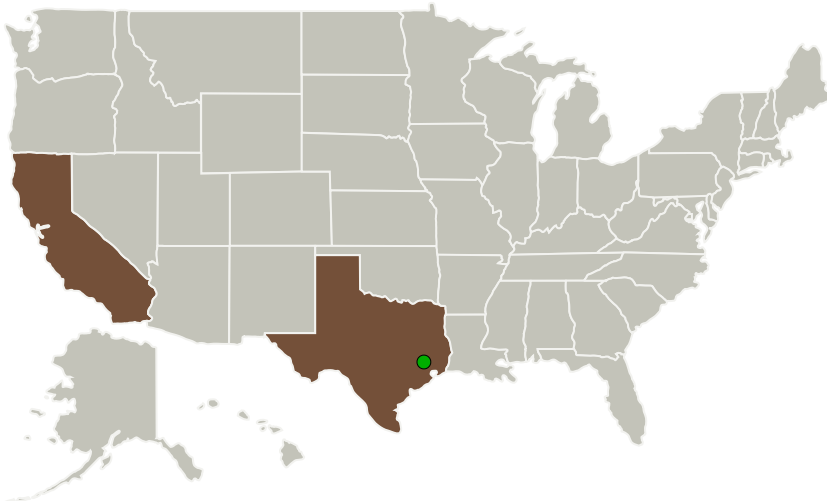
Completed Technology Project (2017 - 2018)




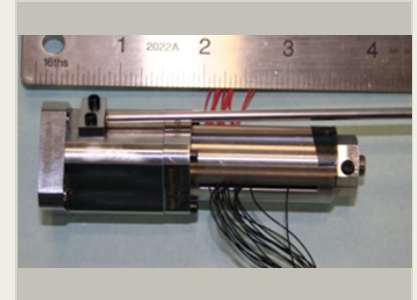
Project Introduction

WASK Engineering proposes to adapt the design of an existing piezo actuated valve that has demonstrated the ability to open within 0.5 msec, operate for more than 2×10^9 cycles while maintaining a leakage rate of less than 1×10^{-3} sccm of He. The valve is less than 3.5 inches long with a maximum width of 1 inch. It has been sized to flow 0.27 lbs/sec of LOX, sufficient to support either the LOX and LCH₄ flow rates of a 100 lbf thruster. A piezo actuated valve has many benefits for RCS thrusters. The speed with which the valve can adjust its throttle position means that with two such valves the thruster propellant mixture ratio can be rapidly adjusted to prevent hardware damage. The valves have the ability to continuously throttle over a range of thrust levels, allowing the thruster to operate from zero to full thrust. The piezo crystals use very little power, reducing the overall power consumption, again reducing weight.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
WASK Engineering, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Cameron Park, California
 Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas



High Response Control Valve, Phase I Briefing Chart Image

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

WASK Engineering, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Texas

Images



Briefing Chart Image

High Response Control Valve, Phase I Briefing Chart Image
 (<https://techport.nasa.gov/image/130089>)

Project Management

Program Director:

Jason L Kessler

Program Manager:

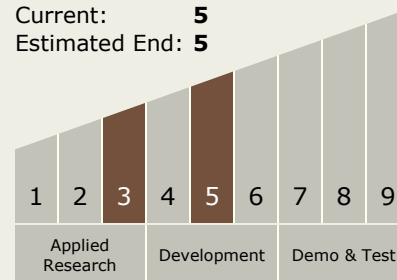
Carlos Torrez

Principal Investigator:

Wendel M Burkhardt

Technology Maturity (TRL)

Start: 3
 Current: 5
 Estimated End: 5



Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.3 Cryogenic